

FINAL REPORT

CLAY TILE INVESTIGATION NSP/ASHLAND LAKEFRONT ASHLAND, WISCONSIN



Prepared for

Xcel Energy, Inc.

512 Nicollet Mall, 8th Floor

Minneapolis, MN 55401

February 19, 2002

URS

URS

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URS Project No. 05644-098

NSP/Ashland Lakefront Site – BRRTS# 02-02-000013

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1.1 SITE DESCRIPTION

Northern States Power Co., a Wisconsin corporation (d.b.a. Xcel Energy, a subsidiary of Xcel Energy, Inc.) hereinafter referred to as Xcel Energy, operates an administration and service facility (storage for energy transmission, operation, and maintenance equipment) located at 301 Lake Shore Drive East in Ashland, Wisconsin. As shown on Figure 1, the site is located in Section 33, Township 48 North, Range 4 West in Ashland County, Wisconsin. The site is located within the city limits of Ashland, and surrounded by city streets. Lake Shore Drive (also U.S. Highway 2) bounds the site to the south. Prentice Avenue and 3rd Avenue East bound the site on the east and west, respectively. St. Claire Street bounds the site to the north. Xcel Energy also owns an equipment storage yard on the north side of St. Claire Street between 3rd Avenue East and private homes west of Prentice Avenue (south of Kreher Park), and a second storage yard on the northeast corner at the intersection of Prentice Avenue and St. Claire Street. Both storage yards are fenced but not paved. General facility information is included in Table 1, and site features are shown on Figure 2.

The Ashland Lakefront Property is located north of the NSP property. The property consists of a flat terrace adjacent to the Chequamegon Bay shoreline. It is bounded by Prentice Avenue and a jetty extension of Prentice Avenue to the east, Ellis Avenue and the marina extension of Ellis Avenue to the west, Chequamegon Bay to the north, and the Wisconsin Central Limited (WCL) railway to the south. The property is owned by the City of Ashland, and is currently being utilized as a park (Kreher Park); a portion of the property is occupied by the City's former wastewater treatment plant.

1.2 SITE HISTORY – NSP PROPERTY

The NSP site is the location of a former Manufactured Gas Plant (MGP) that was operated by a predecessor between 1885 and 1947. The former gas plant building has been incorporated into the current service facility (a block long "U" shaped building south of St. Claire Street). The former MGP building comprises the eastern one-third of this building. An administration office and parking lot are located south of the service building on the same city block, separated by an alley.

MGP operations historically conducted at the site resulted in the creation of coal tar as a by-product. Coal tar is a dark, oily material that had various commercial uses. This tar product was often sold or reused as boiler fuel and stored on-site in tar wells, but some tar was also released to the environment.

Several phases of site investigation have been completed at the facility since 1995. As described in previous reports, these investigations have identified soil and groundwater contamination at the Xcel Energy property. Results of the investigations show that a backfilled ravine that historically opened to Chequamegon Bay is located on the property; the ravine is filled with cinders, ash, demolition material (bricks, concrete, etc.), and fill soil. The mouth of the former ravine is in the approximate area to a feature referred to as the "seep," which is immediately north of the WCL railroad. This feature is an intermittent surface discharge of groundwater containing coal tar and petroleum residuals. Because the backfill material is more permeable

than the surrounding Miller Creek till, the saturated portion of the ravine fill behaves as a perched aquifer. The Miller Creek till is composed of a fine grained low permeability silty clay. Coal tar has been encountered in wells MW-9, TW-13, and MW-15 screened within the backfilled ravine. Coal tar contaminants in the soil within the backfilled ravine exceed recommended Wisconsin Department of Natural Resources (WDNR) soil cleanup standards, and contaminants in groundwater within the ravine exceed ch. NR 140, Wisconsin Administrative Code (WCL) groundwater quality standards.

Site investigation results also show that coal tar migrated vertically into the underlying Copper Falls aquifer. The Copper Falls aquifer in the area of the former MGP is a confined aquifer with strong upward vertical gradients. The Miller Creek formation behaves as an aquitard, or confining unit above the Copper Falls aquifer. These upward vertical gradients have limited the vertical migration of coal tar, minimizing downward movement of the coal tar through the depth of the Copper Falls aquifer. However, the long-term presence of the tar in the aquifer has resulted in a plume of dissolved contaminants extending north beneath Kreher Park. Groundwater within the identified plume is currently not being used as a potable water supply, nor is it a threat to the City of Ashland's drinking water source (Lake Superior).

URS, on behalf of Xcel Energy, designed, coordinated the construction, and is overseeing the operation of a coal tar recovery system for the Copper Falls Aquifer as an interim response. This remediation system was constructed on Xcel property, and was designed to extract coal tar from the aquifer. The system is also capable of treating groundwater that is removed concurrent with the removal of the tar. Coal tar is separated and collected in a holding tank, and then transported off-site for proper disposal. Water is treated in accordance with standards set by the City of Ashland, and discharged to their sanitary sewer system. Additionally, groundwater samples have been collected quarterly from wells screened in the Copper Falls aquifer.

Previous investigations have also identified contamination in Kreher Park and in near shore bay sediments. Contaminated near shore sediments are located within the inlet created by the jetty and marina extension described above.

1.3 KREHER PARK – SITE HISTORY

The Kreher Park area was constructed of fill materials to create land for lumbering operations during the 19th century. Beginning in the mid to late 1800's the area was filled with a variety of fill materials including slab wood, concrete, demolition debris, municipal and industrial wastes, and earth fill. Several lumber companies operated at the site. The largest of these was the Schroeder Lumber Company, which occupied the property between 1901 and 1939 as a sawmill/wood processing facility. Evidence indicates Schroeder conducted wood treatment at the site using coal tar/creosote material. Following Schroeder's active tenure, Ashland County acquired the property in 1939. In 1942, Ashland County transferred title of the site to the City of Ashland, and the City has owned the land since that time. In the 1940's the City operated the northwest portion of Kreher Park as a waste disposal facility (landfill). In 1951, the City constructed a wastewater treatment plant (POTW) on the property, maintaining the plant until 1989. At that time, the City abandoned the plant because coal tar or wood treatment residual contamination was found in an area of the Park that had been proposed for plant expansion. The extension of the Ellis Avenue marina was completed in the mid-1980's. Currently, the property

consists of a grass covered open area, a gravel overflow parking lot for the marina, and a service road. The former wastewater treatment plant is located along the shoreline north of the park; a boat landing is located east of the wastewater treatment plant jetty. The seep area previously described is located on the north side of the WCL railroad, about 250 feet southeast of the former POTW.

1.4 PURPOSE AND SCOPE

The purpose of this report is to present results of two investigations recently completed on the NSP property to locate a buried clay tile at the base of the backfilled ravine. The Scope of Work includes the completion of several excavations on the NSP property to locate a clay tile at the base of the ravine. Part of this work included advancing a remote sensing probe into the tile that transmitted a signal to a receiver at the surface to determine the alignment of the pipe. Samples of coal tar were also collected for fingerprint analysis to add to the database of previous fingerprint results. Fingerprint analyses were performed by the Gas Technology Institute (GTI), discussed in several documents, most recently in a January 15, 2002 report.

2.1 PREVIOUS CLAY PIPE INVESTIGATION ACTIVITIES

The Wisconsin Department of Natural Resources (WDNR) through its consultant Short Elliot Hendrickson (SEH) excavated two trenches at the seep to investigate its source, during February 2001. One trench (West Trench) was excavated on the northwest or down gradient side of the railroad track; the second trench (South Trench) was excavated on the southeast or up gradient side of the railroad track. As described in a March 22, 2001 letter from the WDNR, a concrete pipe approximately 24-inches in diameter was encountered next to two wooden box culverts in the trench excavated on the south side of the railway. A clay tile pipe was encountered in the trench excavated on the north side of the railway. Groundwater entered the trench on the south side of the railway once the box culverts were breached by the backhoe; consequently, further exploration was not possible at that time. Perforated PVC pipe risers were then installed in each trench, and the trenches were backfilled with clean fill. In the March 22, 2001 letter, the WDNR requested 1) a plan for the periodic removal of contaminated liquids, and 2) a conceptual plan for permanently stopping the suspected off-site migration of contaminants purportedly discharged from the box culvert.

Xcel Energy submitted a May 25, 2001 Work Plan to the WDNR to investigate the box culvert, and to expand the fingerprint sample database. The WDNR denied the work plan, and contracted directly with SEH to prepare a work plan and perform the investigation. URS and Xcel Energy representatives were on site during WDNR's investigation, which was performed the week of July 23, 2001.

At that time, SEH re-excavated the northern trench, and the exposed clay tile within the trench was probed to the south using a magnetic locator. (Prior to this re-excavation, URS supplied a tanker truck to remove and manage water entrained in the trench; approximately 30-40 gallons were extracted from the standpipes.) Re-excavation of the south trench exposed a clay tile encased inside a wooden box culvert. Water with a strong petroleum like odor and sheen drained from the tile when uncovered, but slowed to a trickle after the tile was emptied. Both the WDNR and Xcel Energy collected a sample of the discharge from the tile for laboratory analysis. A locating device was then inserted into the clay tile, which transmitted a signal read by a receiving device at the surface. The device approximated the horizontal location of the probe, but could not be used to determine the depth of the probe. Using this device, the clay tile was found to extend 40 feet north of the south trench where it terminated at the exposed outfall in the north trench. It also terminated 103 feet to the south along the west side of the backfilled ravine. At this southern extremity, the device could not be advanced further; the probe was blocked at a point below the Xcel Energy storage yard approximately 70 feet south of the boundary between Xcel Energy's property and Kreher Park. Because of these findings, URS prepared a work plan to further investigate the location of the clay tile on Xcel Energy's property.

2.2 SEPTEMBER 2001 INVESTIGATION ACTIVITIES

Between September 17 and 21, 2001, a series of deep trenches were excavated in the Xcel Energy storage yard. Excavation activities were performed by Superior Special Services, and pipe locating was performed by Visu-Sewer. Site work was coordinated by URS on behalf of

Xcel Energy. Photos of these activities are included in Appendix A. Excavation locations and the location of the clay tile are shown in Figure 2.

Because previous borings advanced in the storage yard indicated that the base of the ravine was more than 25 feet deep in the area where the probe was blocked in July, a deep excavation was completed to locate the clay tile. On September 17, a large excavation with 26.5° sideslopes approximately 60 feet in diameter was first excavated to a depth of approximately 10 feet. A deeper excavation was then completed in the center of the first excavation with sidewall shoring (trench box), transecting the pipe route from west to east. The clay tile was encountered in the deeper excavation at the base of the ravine at an approximate depth of 27.5 feet below ground surface. Wood planks were observed on the sides and top of the clay tile. When encountered by the backhoe, the clay tile was cracked and water drained into the excavation.

On September 18 and 19, tanker trucks were mobilized to the site, and water was pumped from the excavation into the trucks. As pumping lowered the water level in the excavation, the clay tile was exposed, and water draining from the pipe seeped into the excavation. Approximately 5,000 gallons of water were removed from the excavation. The water drained primarily from the pipe on the north side of the excavation. Some of this water likely originated from coarse-grained material near breeches in the pipe. Nevertheless, after this volume was removed, the flow in the pipe slowed to a trickle. These observations confirmed URS' assertion discussed in earlier reports that the low permeability soils in the ravine fill were incapable of transmitting large volumes of water through the mouth of the ravine. The clay tile, however, appeared to be the primary transport mechanism for the groundwater discharge at the seep. The extracted water from the trench was transported across the street to the on-site treatment building, and treated over the next two days at an approximate rate of 10 gallons per minute by carbon filtration prior to discharge to the sanitary sewer. On the afternoon of September 19, a trench box was placed in the excavation over the clay tile. A probe was inserted into the clay tile in an attempt to further delineate the trace of the clay tile using the same probing technique performed earlier by SEH. The clay tile route was traced approximately 19 feet to the south. A blockage prevented the probe from being advanced any further. Surface readings indicated that the probe rose toward the surface as it was advanced.

A second excavation was completed inside the fenced area in front of the easternmost driveway entrance on the south side of the storage yard on September 19. However, the clay tile was not encountered in that excavation. The area between the two excavations along the pipe route was then excavated until the clay tile was located. While excavating along the pipe route, well MW-2B was destroyed. The PVC well casing broke approximately 20 feet below grade. An excavation to locate and abandon this well was completed on September 20. Wells MW-2 and MW-2A were also abandoned at that time, because they were destroyed while excavating to find locate and abandon MW-2B. Well abandonment forms are included in Appendix A.

A third excavation was completed on September 20 in the area in front of the east driveway. The clay tile and wood planks were encountered at a depth of 22.5 feet below ground surface. A trench box was placed in the excavation, and the tile was again probed. The probe met refusal at a point south of the pipe entry at the approximate centerline of St. Claire Street. With this finding, the investigation was terminated. Fill material encountered in the backfilled ravine was

returned to the excavation. Approximately 15 truckloads of clean fill were imported from off-site to backfill the excavation to grade.

2.3 NOVEMBER 2001 INVESTIGATION ACTIVITIES

The September investigation identified the clay tile along an alignment from the storage yard beneath St. Claire Street, toward the approximate center of the courtyard west of the on-site treatment building. Because pipes were also encountered in a trench completed in the courtyard area during construction of the on-site treatment system during July 2000, a supplemental trench investigation was completed on November 12, 2001 to evaluate the alignments of the former pipes encountered in the courtyard. (The locations of these pipes are shown on Sheet 4, of URS' February 14, 2001 *Construction Documentation Report for the Interim Response Coal Tar Recovery System*. Photo documentation of these buried pipe are included in Appendix C of the same report.) This investigation was also completed to show the possible relationship with the clay tile traced from the seep area, to the pipes encountered in the courtyard area.

As with the September 2001 investigation, excavation services were provided by Superior Special Services, and the site work was coordinated by URS. Buried pipes were encountered in the courtyard area in a shallow air line trench excavated between the remediation building and the air compressor located in the NSP maintenance building (the former MGP building). On November 12, 2001, a trench was excavated west and adjacent to the air line trench. Two steel pipes were encountered in that trench at a depth of approximately six feet at locations previously identified. Pipe No. 1 encountered on the southern end of the trench consisted of a small diameter (approximately 2-inches) steel pipe trending east-west with wood planks above and on both sides of the pipe. Pipe No. 2 consisted of a large diameter (approximately 12-inches) steel pipe, also encased in wood, approximately 10 feet north of Pipe No. 1.

NSP equipment was used to attempt to locate the alignment of each pipe. Because both pipes were metallic, a transmitter was connected to each pipe, and the receiver at the surface was used to trace the alignment. Both pipes were traced approximately 20 feet east of the excavation terminating at the exterior wall of the former MGP building. The excavation was then expanded to the west; both pipes terminated in an area where clean fill sand was encountered. The clean fill sand was likely placed as backfill material in the excavation to remove a former concrete tar well in 1993.

Because a six inch diameter clay pipe was encountered in June 2000 near the northeast corner of the remediation building during installation of the remediation system, an excavation between the sidewalk and north side of the remediation building was also made on November 12, 2001. This excavation could not be completed because a concrete foundation was encountered at that location. This clay tile is likely a former drain tile; visual coal tar contamination was not observed in that clay tile encountered when installing the remediation system.

2.4 COLLECTION OF FINGERPRINT SOIL SAMPLES

During the several investigations of the clay pipe, samples of liquid and sludge were collected from the trench risers at the seep, as well as from the clay tile as it was exposed in the subsequent trenches completed on the NSP property. Samples were submitted to Meta Environmental or Watertown, Massachusetts. Fingerprint results were reported to GTI, and were described in detail in the GTI's January 15, 2002 *Fourth Addendum to the Report: Comparative Analysis of NAPL Residues from the NSP Ashland Former MGP Site and the Ashland Lakefront Property (Kreher Park)* report. Sample collection was performed by URS and described for the purposes of this report. Samples were collected during four separate sampling events that occurred on the following dates: July 24 and 25; September 13 and 14; September 19 and 20, and November 12, 2001. A summary of the samples collected is described below.

Samples "Seep Trench West", MW-7, TW-9, "Upgradient Riser" and "Clay Pipe" were collected on July 24 and 25, 2001. All consisted of water samples. Sample "Seep Trench West" was collected from the PVC riser installed in the trench excavated on the northwest (down gradient) side of the railroad at Kreher Park. Sample "MW-7" was collected from well MW-7 at the seep. Sample "TW-9" was collected from well TW-9, located approximately 50 feet west of the seep at Kreher Park. Sample "Up gradient Riser" was collected from the PVC riser pipe installed in the trench excavated on the southeast (up gradient) side of the railroad. Sample "Clay Pipe" was a sample of the contents of the clay tile exposed when the trench on the south (up gradient) side of the railroad was re-excavated.

Samples TW-13, MW-15, "West Trench Riser" and "Up gradient Riser" were collected on September 12 and 13, 2001. The samples TW-13 and MW-15 consisted of non-aqueous phase liquids (NAPL) samples; "West Trench Riser" and "Up gradient Riser" consisted of water samples. Sample "TW-13" was collected from well TW-13 installed along the axis of the filled ravine on the south side of St. Claire Street. Sample "MW-15" was collected from well MW-15 installed in the filled ravine at the location of a former gas holder, in the alley running between West 3rd Street and Prentice Avenue, midway between and parallel to St. Claire Street and Lakeshore Drive. Samples "West Trench Riser" (the same sample location as "Seep Trench West") and "Up gradient Riser" were samples collected from the riser pipes installed in the seep trenches as previously described.

Samples "Clay Tile #1A", "Clay Tile #1B" and "Clay Tile #2" were collected on September 19 and 20, 2001. The sample "Clay Tile #1A" and "Clay Tile #2" were water samples; sample "Clay Tile #1B" was a soil sample. Samples "Clay Tile #1A," "Clay Tile #1B," and "Clay Tile # 2" were collected from the clay tile exposed in the trench excavations in the Xcel Energy storage yard between St. Claire Street and the north property boundary. Samples "Clay Tile #1A" and "Clay Tile #1B" were collected from the tile encountered in the first excavation at a depth of 27.5 feet, which approximates the base of the filled ravine, located at the center of the storage yard. Sample "Clay Tile #1A" consisted of oily water; sample "Clay Tile #1B" consisted of solids collected from the tile at the same location. Sample "Clay Tile #2" was collected from the second excavation at the south end of the storage yard, at a depth of 22.5-feet, approximately 50 feet south of the first excavation. This sample consisted of an oily water mixture, which drained from the pipe.

Samples "Pipe #1" and "Pipe #2" were collected on November 12, 2001. The "Pipe #1" sample was collected from the small diameter pipe encountered in the trench excavated in the courtyard adjacent to and west of the air line trench. The "Pipe #2" sample was collected from the large diameter pipe encountered in that excavation. Both samples consisted of an oily water mixture, which drained from the pipes.

3.1 SUMMARY AND RESULTS

Excavation activities completed by the WDNR in the seep area in February 2001 identified a clay tile encased in a box culvert constructed of wood. The pipe route was subsequently located in July 2001 when the gravel-filled trenches installed in February were re-excavated in the vicinity of the buried pipe. The route of the pipe was then determined with the aid of a locating probe advanced along its length. The probe transmitted a signal to a receiver at the surface used to locate the pipe. At that time, the pipe was found to terminate to the north at the seep, and to the south in the backfilled ravine approximately 70 feet south of the NSP property line in the storage yard north of St. Claire Street.

URS, on behalf of Xcel Energy at the request of the WDNR, performed additional investigative work to locate the clay tile on the Xcel Energy property. Two investigations were completed. The first excavation was completed in September 2001, and the clay tile was located in several deep excavations in the storage yard area north of St. Claire Street. The clay tile was found along the trace of the former ravine. The north end of the pipe terminates at the seep area; the south end of the pipe could not be traced further, where it was found to terminate in St. Claire Street near the easternmost driveway entrance on the south side of the storage yard. Because the southern end of the clay tile is in alignment with the courtyard area south of St. Claire Street, and pipes were previously identified in this area, a second investigation was completed in the courtyard in November 2001. Two steel pipes were encountered on the west side of former MGP building, and extend approximately 20 feet west of the existing building. These pipes terminate in the vicinity of the former tar well removed in 1993. Clean fill-sand, likely used to backfill the tar well excavation was encountered in the excavation where the steel pipe terminated.

3.2 CONCLUSIONS

The discovery of the clay tile located within the backfilled ravine confirmed this pipe as the source of the intermittent groundwater surface discharge at the seep area. (Further surface discharges have not been observed since the gravel trenches were installed during February, 2001.) Although knowledge of the date of installation is unknown, this clay tile was installed along the base of the former ravine sometime prior to the time when the ravine was backfilled. Based on historic Sanborn maps, backfilling of the ravine began sometime around 1890, and was completed in 1909. Although the former use of the pipe could not be determined from the investigation, it is apparent that the clay tile was installed to drain an area south of the ravine.

Because the ravine was backfilled with material more permeable than the surrounding Miller Creek Till, that ravine fill behaves as a perched aquifer. Since the ravine was backfilled with uncontrolled, locally available fill, groundwater saturating the lower portion of the ravine likely seeped into the clay tile through breeches in the pipe. Coal tar waste residuals within the backfill also appear to have penetrated the pipe along with groundwater. Thus the clay tile behaved as a conduit transporting contaminated groundwater within the backfilled ravine to the seep area. The January 15, 2002 GTI report discussed the wide variations among the fingerprints analyzed from the many samples collected during the pipe investigations. (Samples collected during the November courtyard investigation are not included in this report.) Regardless of these

fingerprint findings, however, the pipe- conduit transport mechanism confirms why groundwater samples collected from wells MW-1, MW-2, and MW-5 installed in the backfilled ravine north of St. Claire Street have yielded much lower concentrations of contaminants compared to samples collected from the seep.

TABLES

Table 1
General Facility Information

PROJECT TITLE: NSP/Ashland Lakefront
Clay Pipe Investigation

CURRENT OWNER: Xcel Energy, Inc.

PRIMARY CONTACT: Mr. Jerry Winslow
Xcel Energy
414 Nicollet Mall (Ren. Sq. 8)
Minneapolis, Minnesota 55401
(612) 330-2928 (612) 337-2042 fax

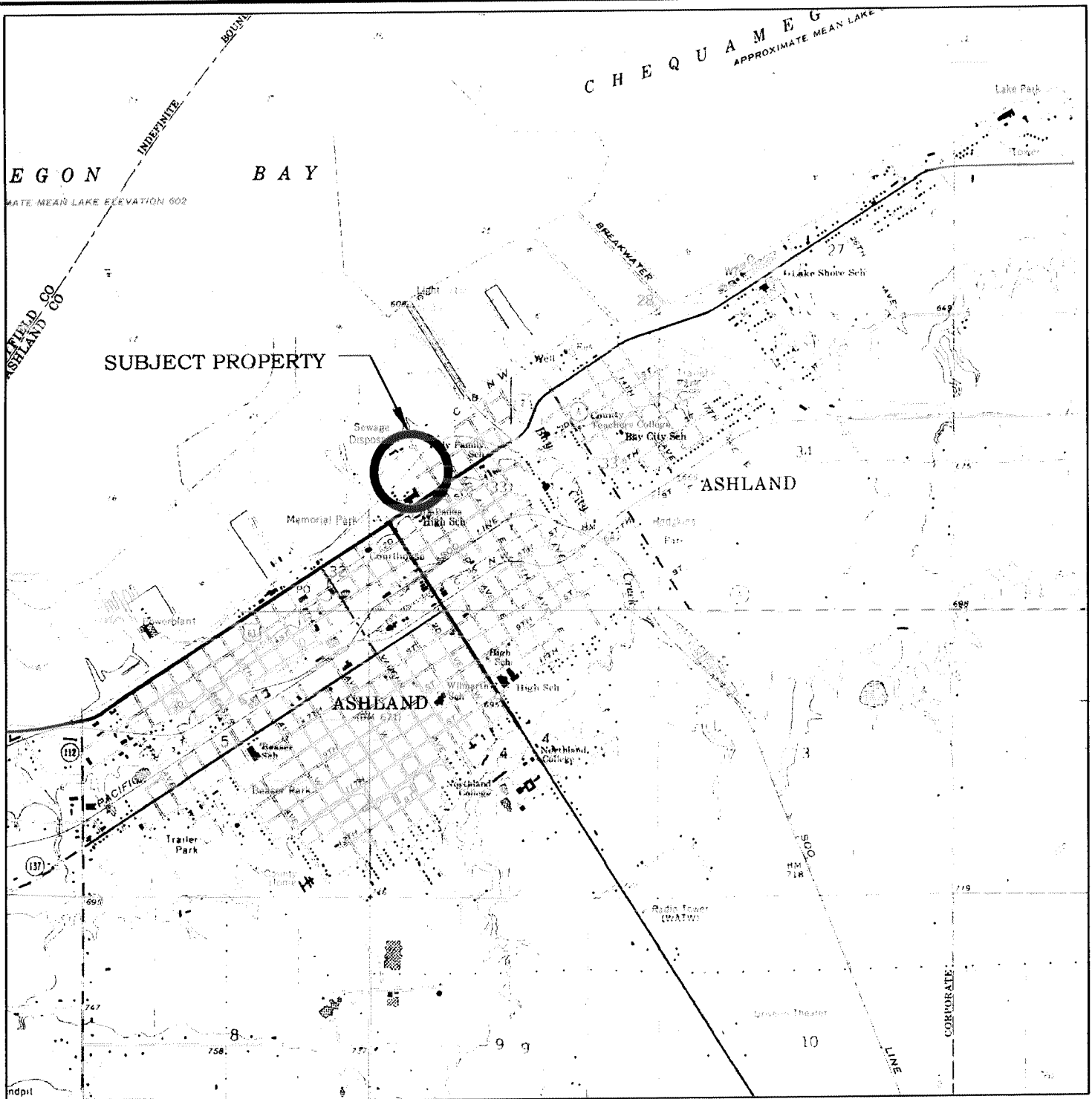
CONSULTANT: David P. Trainor
URS Corporation
5250 East Terrace Drive, Suite I
Madison, Wisconsin 53704
(608) 244-5656 (608) 244-1779 fax

LABORATORY SERVICES: Mr. David Mauro
Meta Environmental, Inc.
49 Claredon Street
Watertown, Massachusetts 02472
(617) 923-4662 (617) 923-4610 fax

EXCAVATION CONTRATOR: Ms. Marci Escamilla
Superior Special Services, Inc.
101 W. Larsen Drive
Fond du Lac, Wisconsin 54936
(920) 924-5547 (920) 923-9010 fax

PIPE LOCATOR: Mr. Ronald Feeny
Visu-Sewer Clean & Seal, Inc.
7905 Beech Street
Fridley, Minnesota 55462
(763) 252-0004 (763) 252-0008 fax

FIGURES



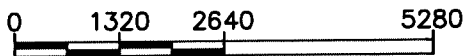
BASE MAP SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, ASHLAND, WISCONSIN, DATED 1964, PHOTOREVISED 1975.



QUADRANGLE LOCATION



NORTH



SCALE IN FEET

PROJECT: NSP/ASHLAND-LAKEFRONT SITE
ASHLAND, WISCONSIN

TITLE: FIGURE 1
SITE LOCATION MAP

DRAWN BY: BRN	SCALE: 1" = 2640'	PROJ. NO. 05644-098
CHECKED BY: DPT	DATE: 31.JAN.02	SHEET 1 OF 2
APPROVED BY: DPT		

URS Dames & Moore

3250 E TERRACE DRIVE, SUITE J
MADISON, WISCONSIN 53718
(608) 244-5858



NORTH

PRENTICE AVENUE

RESIDENTIAL AREA

WISCONSIN CENTRAL RAILROAD

UPGRADIENT RISER

WEST TRENCH RISER/
SEEP TRENCH WEST

SEEP AREA

CLAY TILE #1A
CLAY TILE #1B

CLAY TILE #2

(ALL ABANDONED)

MW-5C
MW-5B
MW-5A

EXCAVATION EXTENTS
SEP 17-19, 2001

EXCAVATION EXTENTS
SEP 19-20, 2001

EXCAVATION EXTENTS
NOV 12, 2001

ST. CLAIRE STREET

VEHICLE STORAGE

VEHICLE STORAGE

3RD AVENUE EAST

EXISTING
AIR LINE

PIPE #2

TAR WELL

MW-9A
MW-9C
EW-3

MW-9
MW-9B

TREATMENT
BUILDING

OFFICE

MW-4
MW-4A
MW-4B

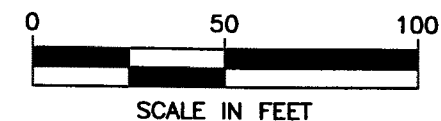
RESIDENTIAL AREA

PAVED
PARKING LOT

MAIN OFFICE

LAKESHORE DRIVE

SAMPLE ID	DATE COLLECTED
SEEP TRENCH WEST	JULY 24/25, 2001
MW-7	JULY 24/25, 2001
TW-9	JULY 24/25, 2001
CLAY PIPE	JULY 24/25, 2001
TW-13	SEPT 12/13, 2001
MW-15	SEPT 12/13, 2001
WEST TRENCH RISER	SEPT 12/13, 2001
UPGRADIENT RISER	SEPT 12/13, 2001
CLAY TILE #1A	SEPT 19/20, 2001
CLAY TILE #1B	SEPT 19/20, 2001



SCALE IN FEET

MW-10A
MW-10
MW-10B

PROJECT: XCEL ENERGY ASHLAND, WISCONSIN		
TITLE: FIGURE 2 SITE MAP - CLAY TILE INVESTIGATION		
DRAWN BY: BRN	SCALE: 1"=50'	PROJ. NO. 05644.097
CHECKED BY: DPT	DATE: 30.JAN.02	SHEET: 1 OF 1
APPROVED BY: DPT		
URS 8200 EIGHT TERRACE DRIVE, SUITE 1 MADISON, WISCONSIN 53718 (608) 244-8886		

FILE: S:\CADDFILES\NSP\GT\SAMPLE_LOCATIONS_REVISED

MW-2(NET)

Appendix A
Photographs Of Clay Tile Excavation Activities



Photo 1- Installing riser pipe in trench back filled with gravel in seep area (February 2001)



Photo 2 - Inserting probe into clay tile in excavation adjacent to seep area. (July 2001)



Photo 3 - Excavating large diameter area to depth of approximately 10 feet. Stockpiling excavated material in north end of storage yard area. (September 17, 2001)



Photo 4 - Unloading trench boxes for use in deep excavation. Large diameter excavation in foreground. (September 17, 2001)



Photo 5 - Water seeping into base of excavation from clay tile when first encountered (clay tile below water level). (September 17, 2001)



Photo 6 - Removing water that drained from clay tile from excavation. (September 19, 2001)



Photo 7 - Placing trench box above clay tile in deep portion of excavation. (September 19, 2001)



Photo 8 - Trench box placed above clay tile. Superior crew cleaning out clay tile prior to inserting probe. (September 19, 2001)



Photo 9 - Superior crew inserting probe into clay tile located beneath trench box. Probe being handed down from surface by Visu-Sewer crew. (September 19, 2001)



Photo 10 - Excavating along top of clay tile in area where probe could not be advanced any further. (September 19, 2001)



Photo 11 - Well MW-2B encountered in side wall of excavation prior to well being destroyed by collapsing side wall. (September 19, 2001)



Photo 12 - Placing trench box in excavation completed by gate for east driveway of storage yard. (September 20, 2001)



Photo 13 - Trench box placed on top of clay tile. Superior crew in trench box advancing probe into pipe which is being handed down from surface. (September 20, 2001)



Photo 14 - Location of deep excavation in front of gate for east driveway to storage yard. (September 20, 2001)

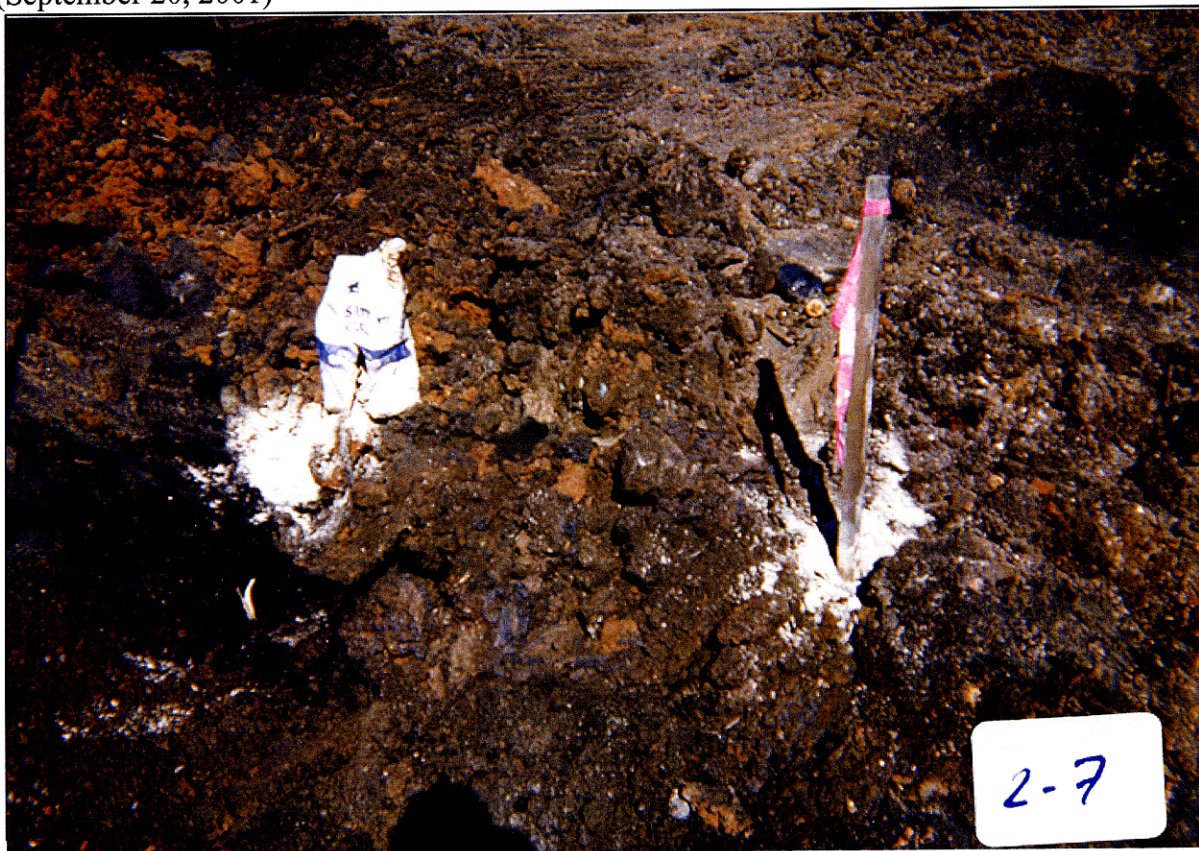


Photo 15 - Wells MW-2 and MW-2A after being abandoned with bentonite. Both wells were destroyed when excavation to locate MW-2B was completed. (September 20, 2001)



Photo 16 - Excavating to an approximate depth of 20 feet to locate well MW -2B which was destroyed when side wall of September 19, 2001 excavation collapsed. (September 20, 2001)



Photo 17 - Placing bentonite in well MW-2B. (September 20, 2001)



Photo 18 - Returning excavated material to excavation and grading level. (September 21, 2001)



Photo 19 - Placing gravel over back filled excavation. (September 21, 2001)



Photo 20 - Gravel placed over back filled excavation and being graded. (September 21, 2001)



Photo 21 - Excavating trench in courtyard area adjacent air line trench leading to remediation building (in background). (November 12, 2001)



Photo 22 - Collecting sample of coal tar which seeped out of small diameter steel pipe encountered in courtyard excavation. (November 12, 2001)



Photo 23 - Small diameter steel pipe at base of courtyard excavation. (November 12, 2001)

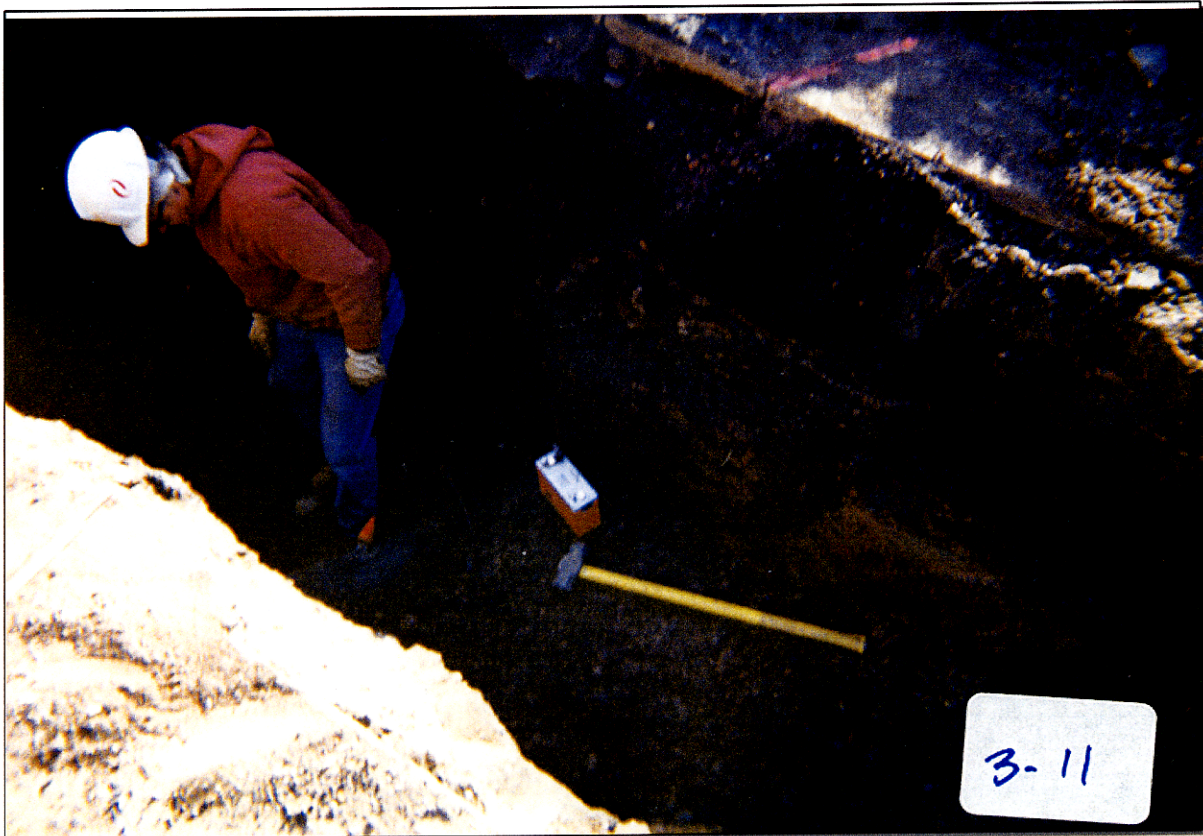


Photo 24 - Xcel Energy employee placing transmitter on large diameter steel pipe encountered in courtyard excavation. (November 11, 2001)



Photo 25 - Large diameter pipe encountered in courtyard excavation terminates in clean fill-sand encountered west of excavation in area of former tar well. (November 11, 2001)



Photo 26 - Back filled excavation in courtyard. (November 13, 2001)

Appendix B
Well MW-2, MW-2a, MW-2b Abandonment Forms

Notice: Please complete Form 3300-5P and return it to the appropriate DNR office and bureau. Completion of this report is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299 Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See the instructions for more information.

Route to: ☐ Drinking Water ☐ Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other

(1) GENERAL INFORMATION

WI Unique Well No. _____ DNR Well ID No. MW-2 County Ashland

Common Well Name _____ Gov't Lot (If applicable) _____

SW 1/4 of NW 1/4 of Sec. 33 ; T. 48 N; R. 4 E ☒ E
Grid Location ☐ W

_____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Local Grid Origin ☐ (estimated: ☐) or Well Location ☐

Lat. _____ Long. _____ or _____

St. Plane _____ ft. N. _____ ft. E. ☐ ☐ ☐ Zone

Reason For Abandonment Well damaged WI Unique Well No. _____
of Replacement Well _____

(2) FACILITY/OWNER INFORMATION

Facility Name NSP- Xcel Energy

Facility ID MW-2 License/Permit/Monitoring No. _____

Street Address of Well 301 Lake Shore Drive East

City, Village, or Town Ashland WI 54806

Present Well Owner Xcel Original Owner same

Street Address or Route of Owner 301 Lake Shore Drive East

City, State, Zip Code Ashland WI 54806

(3) WELL/DRILLHOLE/BOREHOLE INFORMATION

Original Construction Date 9-27-95

☒ Monitoring Well ☐ Water Well ☐ Borehole / Drillhole

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 20 Casing Diameter (in.) 2
(From ground surface) Casing Depth (ft.) 20

Lower Drillhole Diameter (in.) NA

Was Well Annular Space Grouted? ☒ Yes ☐ No ☐ Unknown
If Yes, To What Depth? 8 Feet

Depth to Water (Feet) 20

(4) PUMP, LINER, SCREEN, CASING, & SEALING MATERIAL

Pump & Piping Removed? ☐ Yes ☐ No ☒ Not Applicable

Liner(s) Removed? ☐ Yes ☐ No ☒ Not Applicable

Screen Removed? ☐ Yes ☒ No ☐ Not Applicable

Casing Left in Place? ☒ Yes ☐ No

Was Casing Cut Off Below Surface? ☒ Yes ☐ No

Did Sealing Material Rise to Surface? ☐ Yes ☒ No

Did Material Settle After 24 Hours? ☐ Yes ☒ No

If Yes, Was Hole Retopped? ☐ Yes ☐ No

Required Method of Placing Sealing Material
☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain) _____

Sealing Materials

<input type="checkbox"/> Neat Cement Grout	For monitoring wells and monitoring well boreholes only
<input type="checkbox"/> Sand-Cement (Concrete) Grout	
<input type="checkbox"/> Concrete	
<input type="checkbox"/> Clay-Sand Slurry (11 lb./gal. wt.)	
<input type="checkbox"/> Bentonite-Sand Slurry " "	
<input type="checkbox"/> Bentonite Chips	
<input type="checkbox"/> Bentonite Chips	<input type="checkbox"/> Bentonite Chips
	<input checked="" type="checkbox"/> Granular Bentonite
	<input type="checkbox"/> Bentonite - Cement Grout
	<input type="checkbox"/> Bentonite - Sand Slurry

(5) Material Used To Fill Well/Drillhole

From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	(Circle One)	Mix Ratio or Mud Weight
Surface	20	15		lbs.

(6) Comments: well damaged during clay tile investigation

(7) Name of Person or Firm Doing Sealing Work

Mark McColloch - URS Date of Abandonment 9-20-01

Signature of Person Doing Work Mark L. McColloch Date Signed 9-21-01

Street or Route 5250 E. Terrace Dr. Telephone Number (608) 244-5656

City, State, Zip Code Madison, WI 53718

FOR DNR OR COUNTY USE ONLY

Date Received _____ Noted By _____

Comments _____

Notice: Please complete Form 3300-5P and return it to the appropriate DNR office and bureau. Completion of this report is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See the instructions for more information.

Route to: ☐ Drinking Water ☐ Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other

(1) GENERAL INFORMATION

WI Unique Well No. _____ DNR Well ID No. MW-2A County Ashland

Common Well Name _____ Gov't Lot (If applicable) _____

Grid Location SW 1/4 of NW 1/4 of Sec. 33; T. 48 N.; R. 4 E.

_____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Local Grid Origin ☐ (estimated: ☐) or Well Location ☐

Lat. _____ Long. _____ or _____

St. Plane _____ ft. N. _____ ft. E. ☐ ☐ ☐ Zone _____

Reason For Abandonment Well damaged WI Unique Well No. _____
of Replacement Well _____

(3) WELL/DRILLHOLE/BOREHOLE INFORMATION

Original Construction Date 6-7-00

☒ Monitoring Well
☐ Water Well
☐ Borehole / Drillhole

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 45 Casing Diameter (in.) 2
(From ground surface) Casing Depth (ft.) 45

Lower Drillhole Diameter (in.) NA

Was Well Annular Space Grouted? ☒ Yes ☐ No ☐ Unknown

If Yes, To What Depth? 36 Feet

Depth to Water (Feet) 45

(5) Material Used To Fill Well/Drillhole

Material	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	(Circle One)	Mix Ratio or Mud Weight
Bentinite	Surface	45	35		lbs.

(6) Comments: well damaged during clay tile investigation

(7) Name of Person or Firm Doing Sealing Work

Mark McGillich - URS Date of Abandonment 9-20-01

Signature of Person Doing Work Mark L. McGillich Date Signed 9-21-01

Street or Route 5250 E. Terrace Dr. Telephone Number (608) 244-5656

City, State, Zip Code Madison, WI 53718

FOR DNR OR COUNTY USE ONLY	
Date Received	Noted By
Comments	

Notice: Please complete Form 3300-5P and return it to the appropriate DNR office and bureau. Completion of this report is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See the instructions for more information.

Route to: ☐ Drinking Water ☐ Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other

(1) GENERAL INFORMATION

WI Unique Well No.	DNR Well ID No.	County
	MW-2B	Ashland
Common Well Name _____ Gov't Lot (If applicable) _____		
SW 1/4 of NW 1/4 of Sec. 33; T. 48 N.; R. 4 E		
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/>		
Lat. _____ Long. _____ or _____		
St. Plane _____ ft. N. _____ ft. E. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Zone		
Reason For Abandonment	WI Unique Well No.	
Well damaged	of Replacement Well _____	

(2) FACILITY/OWNER INFORMATION

Facility Name	
NSP- Xcel Energy	
Facility ID	License/Permit/Monitoring No.
MW-2B	
Street Address of Well	
301 Lake Shore Drive East	
City, Village, or Town	
Ashland WI 54806	
Present Well Owner	Original Owner
Xcel	same
Street Address or Route of Owner	
301 Lake Shore Drive East	
City, State, Zip Code	
Ashland WI 54806	

(3) WELL/DRILLHOLE/BOREHOLE INFORMATION

Original Construction Date	6-8-00
<input checked="" type="checkbox"/> Monitoring Well	If a Well Construction Report is available, please attach.
<input type="checkbox"/> Water Well	
<input type="checkbox"/> Borehole / Drillhole	
Construction Type:	
<input checked="" type="checkbox"/> Drilled	<input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug
<input type="checkbox"/> Other (Specify) _____	
Formation Type:	
<input checked="" type="checkbox"/> Unconsolidated Formation	<input type="checkbox"/> Bedrock
Total Well Depth (ft.)	Casing Diameter (in.)
70	2
(From ground surface)	Casing Depth (ft.)
	70
Lower Drillhole Diameter (in.)	NA
Was Well Annular Space Grouted?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
If Yes, To What Depth?	61 Feet
Depth to Water (Feet)	70

(4) PUMP, LINER, SCREEN, CASING, & SEALING MATERIAL

Pump & Piping Removed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable
Liner(s) Removed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable
Screen Removed?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Applicable
Casing Left in Place?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Was Casing Cut Off Below Surface?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Did Sealing Material Rise to Surface?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did Material Settle After 24 Hours?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, Was Hole Retopped?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Required Method of Placing Sealing Material	
<input checked="" type="checkbox"/> Conductor Pipe Gravity	<input type="checkbox"/> Conductor Pipe-Pumped
<input type="checkbox"/> Screened & Poured (Bentonite Chips)	<input type="checkbox"/> Other (Explain)
Sealing Materials	For monitoring wells and monitoring well boreholes only
<input type="checkbox"/> Neat Cement Grout	<input type="checkbox"/> Bentonite Chips
<input type="checkbox"/> Sand-Cement (Concrete) Grout	<input checked="" type="checkbox"/> Granular Bentonite
<input type="checkbox"/> Concrete	<input type="checkbox"/> Bentonite - Cement Grout
<input type="checkbox"/> Clay-Sand Slurry (11 lb./gal. wt.)	<input type="checkbox"/> Bentonite - Sand Slurry
<input type="checkbox"/> Bentonite-Sand Slurry " "	
<input type="checkbox"/> Bentonite Chips	

(5) Material Used To Fill Well/Drillhole

Material	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	(Circle One)	Mix Ratio or Mud Weight
Bentonite	Surface	70	50		lbs.

(6) Comments: well damaged during ody file investigation

(7) Name of Person or Firm Doing Sealing Work

Mark McGoiloch - URS	Date of Abandonment
	9-20-01
Signature of Person Doing Work	Date Signed
Mark L McGoiloch	9-21-01
Street or Route	Telephone Number
5250 E. Terrace Dr.	(608) 244-5656
City, State, Zip Code	
Madison, WI 53718	

FOR DNR OR COUNTY USE ONLY	
Date Received	Noted By
Comments	